WHAT IS CLAIMED IS:

1    1.    A communications method for use in a communications
2    system including a first device and a second device, the
3    method comprising the steps of:
4          operating the first device to receive first
5    communications channel condition information regarding
6    the condition of a first communications channel existing
7    between the first device and the second device; and
8          determining, as a function of the first
9    communications channel condition information, when to
10   transmit data from the first device to said second
11   device.

1    2.    The communications method of claim 1, further
2    comprising the step of:
3          determining the rate at which to transmit data
4    to the first device as a function of the first
5    communications channel condition information.

1    3.    The communications method of claim 2, further
2    comprising the step of:
3          allocating bandwidth as a function of the
4    determined data transmission rate.

1    4.    The communications method of claim 3, wherein the
2    step of allocating bandwidth includes:
3          allocating a first amount of bandwidth when the
4    determined data transmission rate is a first rate; and

5       allocating a second amount of bandwidth which

6  is greater than the first amount when the determined data

7  transmission rate is a second rate which is greater than

8  the first rate.


1  5.    The communications method of claim 2, further

2  comprising the step of:

3       controlling the amount of power used to

4  transmit data from the first device to the second device

5  as a function of the determined data transmission rate.


1  6.    The communications method of claim 2, further

2  comprising:

3       using a first amount of power to transmit data

4  from the first device to the second device when the

5  determined data transmission rate is a first rate; and

6       using a second amount of power to transmit data

7  from the first device to the second device, which is

8  greater than the first amount of power, when the

9  determined data transmission rate is a second rate which

10 is greater than the first rate.


1  7.    The method of claim 1, wherein the system further

2  includes a third device, the method further comprising:

3       operating the first device to receive second

4  communications channel condition information regarding

5  the condition of a second communications channel existing

6  between the first device and the third device; and

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7            determining, as a function of the second
8     communications channel condition information, when to
9     transmit data to said third device.


1     8.   The method of claim 7, further comprising the step
2     of:
3            operating the second device to measure the
4     amplitude of a first signal received from the first
5     device; and
6            transmitting first signal amplitude information
7     from the second device to the first device, said first
8     communications channel condition information including
9     said first signal amplitude information.


1     9.   The method of claim 8, further comprising the step
2     of:
3            operating the third device to measure the
4     amplitude of a second signal received from the first
5     device; and
6            transmitting second signal amplitude
7     information from the third device to the first device,
8     said second communications channel condition information
9     including said second signal amplitude information.


1     10.  The method of claim 9, wherein the first device is a
2     base station, and the second and third devices are mobile
3     stations.


1     11.  The method of claim 7, wherein the step of
2     determining when to transmit data includes the step of:
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3          scheduling data transmissions to said second

4    and third devices such that the devices associated with

5    better channel conditions are given scheduling preference

6    over devices associated with poorer channel conditions.


1    12.   The method of claim 7, further comprising the steps

2    of:

3          transmitting a first data signal from the first

4    device to the second device, the step of transmitting

5    including:

6          introducing a variation into the first data

7    signal which can be detected by the second device as a

8    change in the first data signal over time.


1    13.   The method of claim 12, wherein the variation

2    introduced into the first data signal includes at least

3    one of a phase variation and an amplitude variation.


1    14.   The method of claim 12, wherein said first data

2    signal includes a pilot signal.


1    15.   The method of claim 14, wherein said introduced

2    variation is a phase variation.


1    16.   The method of claim 14, wherein said introduced

2    variation is an amplitude variation.


1    17.   The method of claim 7, further comprising the steps

2    of:

3            transmitting, using a plurality of N antennas,

4    the same data to the second device, N being a positive

5    integer greater than one, the step of transmitting

6    including:

7            transmitting from a first antenna in said

8    plurality of N antennas a first data signal including

9    said data; and

10           transmitting from a second antenna in said

11    plurality of N antennas a second data signal including

12    the same data as said first data signal, the second data

13    signal having a phase which is different from the first

14    data signal.


1    18.  The method of claim 17, further comprising the step

2    of:

3           varying the phase of at least one of the first

4    and second data signals being transmitted as a function

5    of time.


1    19.  The method of claim 18, wherein the first and second

2    data signals have the same center frequency, fc.


1    20.  The method of claim 19, further comprising the step

2    of spacing the first and second antennas at least one

3    half a wavelength apart, wherein the wavelength is equal

4    to C divided by fc, where C is the speed of light.


1    21.  The method of claim 17, wherein the first and second

2    data signals have the same carrier frequency, fc.

1     22. The method of claim 20, further comprising the step
2     of spacing the first and second antennas at least one
3     half a wavelength apart, wherein the wavelength is equal
4     to C divided by fc, where C is the speed of light.

1     23. The method of claim 18, further comprising the step
2     of:
3           varying the relative amplitudes of the first
4     and second data signals over time.

1     24. The method of claim 23, wherein the first and second
2     data signal include symbols having a symbol period, the
3     method further comprising the step of:
4           using a fixed average amount of power over at
5     least one symbol period to transmit the combination of
6     the first and second data signals.

1     25. The method of claim 17, further comprising the step
2     of:
3           varying the relative amplitudes of the first
4     and second data signals as a function of time while
5     maintaining the combined average transmitted power of the
6     first and second data signals at an almost constant value
7     over the period in time during which the relative
8     amplitudes of the first and second data signals are
9     varied.

1     26. The method of claim 25, wherein N is greater than
2     two.

1   27.   A communications method, comprising the steps of:

2           operating a base station to receive channel

3   condition information from each of a plurality of mobile

4   stations, the channel condition information received from

5   each mobile station including information indicating the

6   quality of a communications channel associated with the

7   mobile station; and

8           scheduling transmissions to said mobile

9   stations from said base station as a function of the

10  quality of the communications channel associated with the

11  individual mobile stations.


1   28.   The communications method of claim 27, further

2   comprising the step of:

3           allocating bandwidth for data transmissions to

4   said mobile stations from said base stations as a

5   function of the quality of the communications channel

6   associated with the individual mobile stations.


1   29.   The communications method of claim 28, wherein the

2   step of allocating bandwidth includes:

3           allocating more bandwidth when the quality of

4   the communications channel associated with an individual

5   mobile station is in a first state than when the

6   communications channel associated with an individual

7   mobile station is in a second state which is poorer for

8   communications than the first state.


1   30.   The communications method of claim 27, further

2   comprising the step of:

3        controlling the amount of power used to
4   transmit data from the base station to one of the mobile
5   stations as a function of the quality of the
6   communications channel associated with said one of the
7   mobile stations.

1   31.   The communications method of claim 30, wherein the
2   step of controlling the amount of power includes the step
3   of:
4        using a first amount of power to transmit data
5   from the base station to said one of the mobile stations
6   when the quality of the communications channel associated
7   with said one of the mobile stations is of a first degree
8   of quality; and
9        using a second amount of power to transmit data
10  from the first device to the second device, which is
11  greater than the first amount of power, when the quality
12  of the communications channel associated with said one of
13  the mobile stations is of a second degree of quality
14  which is better for communications than the first degree
15  of quality.

1   32.   The communications method of claim 27, further
2   comprising the step of:
3        determining the rate at which to transmit data
4   to each of said mobile stations as a function of the
5   quality of the communications channel associated with
6   each of the mobile stations.

1    33.   The communication method of claim 27, wherein the
2    step of scheduling transmission to said mobile stations
3    includes the step of:
4            operating a scheduling routine which includes a
5    preference for transmitting to mobile stations associated
6    with communications channels having good channel
7    conditions prior to transmitting to mobile stations
8    associated with communications channels with poorer
9    channel conditions.


1    34.   The communications method of claim 33, further
2    comprising the step of:
3            transmitting first and second signals including
4    the same information to each mobile station, the step of
5    transmitting including:
6            using a first antenna to transmit the first
7    signal; and
8            using a second antenna to transmit the second
9    signal.


1    35.   The communications method of claim 34, wherein the
2    first and second signals vary in relation to one another
3    over time in at least one of phase and amplitude but have
4    the same center frequency.


1    36.   The communications method of claim 34, wherein the
2    first and second signals vary in relation to one another
3    over time in at least one of phase and amplitude but have
4    the same carrier frequency.

1     37. The communications method of claim 34, wherein the
2     second antenna is located at a second base station, the
3     method further comprising the step of:
4             operating the first base station to control the
5     second base station to broadcast the second signal using
6     the second antenna located at the second base station.

1     38. The communications method of claim 37, further
2     comprising the step of:
3             determining the rate at which to transmit data
4     to each of said mobile stations as a function of the
5     received channel condition information.

1     39. A communications method, comprising the steps of:
2             operating a base station to estimate the
3     condition of communications channels between the base
4     station and mobile stations from signals received from
5     the mobile stations; and
6             scheduling transmissions from said mobile
7     stations to said base station as a function of the
8     estimated quality of the communications channels between
9     the individual mobile stations and the base station.

1     40. The communications method of claim 39, further
2     comprising the step of:
3             determining the rate at which to transmit data
4     to at least one of said mobile stations as a function of
5     the estimated channel condition information.

1　41. The communications method of claim 40, further
2　comprising the step of:
3　　　　　allocating bandwidth for communications to the
4　at least one of said mobile stations as a function of the
5　determined data transmission rate.

1　42. The communications method of claim 40, further
2　comprising the step of:
3　　　　　controlling the amount of power used to
4　transmit data to the at least one of said mobile stations
5　as a function of the determined data transmission rate.

1　43. The communication method of claim 40, wherein the
2　step of scheduling transmission to said mobile stations
3　includes the step of:
4　　　　　operating a scheduling routine which includes a
5　preference for allowing mobile stations associated with
6　communications channels having good channel conditions to
7　transmit prior to mobile stations associated with
8　communications channels with poorer channel conditions.

1　44. A method of transmitting data between a first device
2　and a second device, comprising the steps of:
3　　　　　providing a plurality of N separate antennas,
4　said plurality including at least a first antenna and a
5　second antenna, N being a positive integer greater than
6　one;
7　　　　　operating the first device to transmit from the
8　first antenna, a first signal including said data the
9　first signal having a carrier frequency, fc, a broadcast

10    region from the first antenna including the second
11    device;

12            operating the first device to transmit from
13    the second antenna, a second signal including said data
14    the second signal having the same carrier frequency, fc,
15    as the first signal, a broadcast region from the second
16    antenna including the second device, at least one of a
17    phase and an amplitude of the second signal varying over
18    time relative to the first signal.

1    45.   The method of claim 44, wherein the phase of the
2    second signal varies over time relative to the phase of
3    the first signal, the method further comprising the step
4    of:
5            introducing a variation into the phase of the
6    second signal as a function of time prior to operating
7    the second antenna to transmit the second signal.

1    46.   The method of claim 45, further comprising the step
2    of:
3            controlling the rate at which data is
4    transmitted as part of the first signal as a function of
5    transmission channel quality information.

1    47.   The method of claim 45, wherein the first device is
2    a base station and the second device is a mobile station.

1    48.   The method of claim 45, wherein the first device is
2    a mobile station and the second device is a base station.

49. A method of transmitting data between a first device and a second device, comprising the steps of:

providing a plurality of N separate antennas, said plurality including at least a first antenna and a second antenna, N being a positive integer greater than one;

operating the first device to transmit from the first antenna, a first signal including said data the first signal having a center frequency, a broadcast region from the first antenna including the second device;

operating the first device to transmit from the second antenna, a second signal including said data the second signal having the same center frequency as the first signal, a broadcast region from the second antenna including the second device, at least one of a phase and an amplitude of the second signal varying over time relative to the first signal.

50. The method of claim 49, further comprising the steps of:

introducing a variation into the phase of the second signal as a function of time prior to operating the second antenna to transmit the second signal; and

controlling the rate at which data is transmitted as part of the first signal as a function of transmission channel quality information.

51. A communications apparatus, comprising:

a source of data;

3        a transmitter circuit coupled to the source of

4   data for generating a plurality of data signals each data

5   signal including the same data, the plurality of data

6   signals including a first data signal and a second data

7   signal the first and second data signals differing from

8   one another as a function of time by at least one of a

9   phase and an amplitude; and

10        a plurality of antennas coupled to said

11   transmitter circuit to receive and transmit said data

12   signals in parallel, each antenna receiving and

13   transmitting one of said data signals.


1   52. The apparatus of claim 51,

2        wherein the transmitter circuit includes means

3   for independently varying the phase of at least one of

4   the first and second data signals as a function of time.


1   53. The apparatus of claim 52, further comprising:

2        a receiver for receiving communications channel

3   condition information; and

4        means for determining the rate at which data

5   should be transmitted in said first and second data

6   signals as a function of the communications channel

7   information.


1   54. The apparatus of claim 52, further comprising:

2        a receiver for receiving communications channel

3   condition information from a plurality of mobile stations

4   regarding the condition of a communications channel

5      associated with individual ones of said plurality of
6      mobile stations; and
7              means for scheduling transmission of data to
8      individual mobile stations as a function of the received
9      communications channel condition information.

1      55.   The apparatus of claim 54,
2              wherein the means for scheduling includes a
3      scheduling routine which gives preferential treatment to
4      the scheduling of data transmissions to mobile stations
5      with good communications channels as compared to mobile
6      stations with poorer communications channels.

1      56.   The apparatus of claim 55, further comprising:
2              means for determining the rate at which data
3      should be transmitted in said first and second data
4      signals as a function of the communications channel
5      information.

1      57.   The apparatus of claim 54,
2              wherein the first and second data signals have
3      the same center frequency, fc and a wavelength W at the
4      center frequency; and
5              wherein the first and second antennas are
6      spaced at least one half the distance of the wavelength W
7      from each other.

1      58.   The apparatus of claim 54,

2               wherein the first and second data signals have

3    the same carrier frequency, fc and a wavelength W at the

4    carrier frequency; and

5               wherein the first and second antennas are

6    spaced at least one half the distance of the wavelength W

7    from each other.


1    59.   The apparatus of claim 51,

2               wherein the first and second data signals have

3    the same center frequency, fc and a wavelenth W at the

4    center frequency; and

5               wherein the first and second antennas are

6    spaced at least one half the distance of the wavelenth W

7    from each other.


1    60.   The apparatus of claim 51,

2               wherein the first and second data signals have

3    the same carrier frequency, fc and a wavelenth W at the

4    carrier frequency; and

5               wherein the first and second antennas are

6    spaced at least one half the distance of the wavelenth W

7    from each other.


1    61.   The apparatus of claim 51, further comprising:

2               means for using a fixed amount of power to

3    transmit the combination of the first and second data

4    signals over time.


1    62.   The apparatus of claim 61, further comprising:

2      means for varying the relative amplitudes of

3    the first and second data signals as a function of time

4    while maintaining the combined average transmitted power

5    of the first and second data signals at an almost

6    constant value over the period in time during which the

7    relative amplitudes of the first and second data signals

8    are varied.

1    63. A communications system, comprising:

2        a mobile station; and

3        a base station, the base station including:

4            i.  a receiver for receiving

5            communications channel condition

6            information regarding the condition of a

7            first communications channel existing

8            between the first device; and

9            ii. means for determining the rate at

10           which data is transmitted to said mobile

11           station as a function of the channel

12           condition information.

1    64. The communications system of claim 63, further

2    comprising:

3        a plurality of additional mobile stations, the

4    base station receiver receiving additional communications

5    channel condition information regarding the condition of

6    additional communications channels existing between the

7    base station and said additional mobile stations.

1    65.  The communication system of claim 64, further
2    comprising:
3              means for determining the order in which the
4    base station is to transmit data to different mobile
5    stations as a function of said communication channel
6    condition information and said additional communications
7    channel condition information.


1    66.  The communication system of claim 65, wherein the
2    base station further includes:
3              at least a first and second antenna for
4    broadcasting first and second signals including the same
5    data to one of said mobile stations, the first and second
6    signals having different phases.


1    67.  The communication system of claim 65, wherein the
2    base station further includes:
3              at least a first and second antenna for
4    broadcasting first and second signals including the same
5    data to one of said mobile stations the first and second
6    signals having different amplitudes.


1    68.  The communication system of claim 65, wherein the
2    base station further includes:
3              means for introducing signal variations into
4    signals transmitted to the mobile stations so that the
5    mobile stations will detect fluctuations in received
6    signal power.

1     69. The communication system of claim 68, wherein said

2     means for introducing signal variations into signals

3     includes a plurality of antennas for transmitting the

4     same data in parallel.

1     70. A mobile communications device, comprising:

2             a portable housing;

3             transmitter circuitry, mounted in said portable

4     housing, for generating a plurality of signals including

5     the same data content but having phases which vary

6     relative to each other over time; and

7             a plurality of antennas attached to said

8     housing, said antennas being coupled to said transmitter

9     circuitry, each antenna being used to transmit a

10    different one of said plurality of signals including the

11    same data content.

1     71. The device of claim 70, further comprising:

2             receiver circuitry for receiving a signal from

3     a base station; and

4             means for generating communications channel

5     condition information from the signal received from the

6     base station.